

Accelerating product design at Jaguar Land Rover



Hartree Centre
Science & Technology Facilities Council



VIRTUAL
ENGINEERING
CENTRE



Collaborative expertise and access to supercomputing facilities has enabled Hartree Centre partner, the Virtual Engineering Centre (VEC) to develop computer-aided engineering (CAE) process templates and optimisation methods to support future designs for Jaguar Land Rover.

Challenge

World class automotive company Jaguar Land Rover's approach is to seek opportunities in technological developments and expertise to continually improve their development process and product performance. Jaguar Land Rover and the Virtual Engineering Centre combined their expertise in the development of scientific workflows, enabling them to optimise their modelling and simulation processes, incorporating multiple disciplines and regression methods.

Solution

An integrated CAE process for maximising vehicle performance in pedestrian safety, according to the EuroNCAP standards subject to structural stiffness constraints, was developed by the VEC, using scientific workflows connected to high performance computing resources. Hundreds of design variants were created, invoking powerful modelling tools through automatic procedures, allowing the extensive exploration of the design space and vehicle's performance. Regression techniques, implemented by the University of Liverpool, were used in optimisation workflows, leading to an optimal design. Seamless access to the supercomputing facilities provided by the Hartree Centre was a key enabler for the project.

Benefits

Virtual engineering allows organisations to investigate the performance of products in the early stages of their design process, minimising the use of physical prototypes and leading to considerable reductions in time-to-market and manufacturing costs.

Elements of the developed workflows have already been adopted into the modelling process by Jaguar Land Rover. Through this collaboration, the company was able to achieve a tenfold increase of the investigated complex scenarios, using more than 3 million core-hours on the Hartree Centre's iDataplex cluster, Blue Wonder. The VEC provided fast interpretation and manipulation of thousands of results, as well as improved designs, using accurate numerical methods.

Work with us

We collaborate with industrial clients and research partners on projects that create insights and value using high performance computing, big data analytics, simulation and modelling.

By combining our world-class facilities with access to our specialists and computational scientists, we can enable your organisation to produce better outcomes, products and services more quickly and cost-effectively than through conventional R&D workflows.

With our partners we are developing the next generation of supercomputing architectures and software, combining existing best practice with innovation to deliver faster, cooler and more sustainable solutions capable of meeting the challenges of data intensive computing.

For more information:

 +44 (0)1925 603708

 hartreecomms@stfc.ac.uk

 @hartreecentre

 /company/stfc-hartree-centre

www.stfc.ac.uk/hartree